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BEFORE THE

Federal Communications Commission

WASHINGTON, DC 20554

In the Matter of	)	DOCKET FILE COPY ORIGINAL
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Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service	)	MM Docket No. 87-268
	)	
	)	
	)	
Directed to: The Commission		

PETITION FOR RECONSIDERATION

KSLS, Inc., licensee of KSCI(TV), San Bernardino, California ("KSCI"), hereby respectfully submits its Petition for Reconsideration with respect to the Commission's *Fifth and Sixth Reports and Orders* in the above-captioned proceeding.[1]

KSCI currently operates on NTSC channel 18 and has been assigned DTV channel 61. We are very concerned about the potential interference that KSCI's NTSC signal will receive from station KUSI, San Diego, whose DTV allotment also is channel 18. The FCC estimates that KSCI will suffer the greatest area of interference of any station in the Los Angeles area, *i.e.*, 12.1% of the area and 1.6% of the population inside KSCI's NTSC contour, affecting 2,834 square miles and approximately 190,000 viewers.

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[1] Should the FCC release additional technical information relating to the DTV allotment table (particularly OET Bulletin No. 69) during the pendency of this proceeding, KCSI requests leave to supplement this Petition as necessary based on that information.

KSCI strongly believes that the FCC has failed to consider certain factors specific to the Los Angeles market and thus has underestimated the potential interference to KSCI's NTSC signal. First, Los Angeles is a very large metropolitan area, and as a result many of KSCI's viewers live in apartment buildings. Most of these viewers do not have access to an outside directional antenna and must use a UHF loop on the back of their television set. The FCC's calculations, however, were based on the use of directional antennas that help minimize interference.

Second, it is a well known fact that broadcast signals often experience a "ducting" effect that allows them to travel greater distances than over water than over normal terrain. As a result, a large portion of KSCI's viewers who live near the Pacific coast can easily receive the signals of the San Diego television stations. The coastal areas affected by this phenomenon include some very highly populated areas; the city of Long Beach alone has a population of nearly 430,000 people. We believe that the combination of poor receive antennas and greater than calculated signals from San Diego will produce much higher levels of interference than predicted by the FCC.

The attached engineering study prepared for KSCI by Hammett & Edison, Inc. further illustrates the problem. Appendix E of the *Sixth Report and Order* requires a DTV/NTSC co-channel separation of 244.6 kilometers. The distance between KUSI and KSCI is only 179.9 kilometers, 64.7 kilometers short of the required spacing. Furthermore, though Hammett & Edison's interference calculations correspond reasonably well with those of the FCC, the study points out that the Longley-Rice

propagation model used by the FCC often returned errors on some studied paths, which resulted in the FCC allotment program (and, correspondingly, the Hammett & Edison analysis program) counting the associated error cells as *interference-free service area.* In areas of mountainous terrain, Hammett & Edison has found that error cells can result within a significant part of a studied station's coverage area. Thus, the area of uncertainty in the interference calculations represents about 10% of the population within the KSCI NTSC contour.

There appear to be many other DTV channels that would work in San Diego without causing interference to KSCI, and hence we do not understand why the FCC assigned a short spaced co-channel DTV allotment to KUSI. Virtually all of the frequencies in the Bakersfield market could have been reused for DTV allotments in San Diego without creating additional interference. Those channels include 17, 23, 29, 31 and 45.

As noted in KSCI's earlier comments in this proceeding, KSCI's situation highlights the advantages of co-locating all the stations in the Los Angeles market to one transmitter site. In fact, it is KSCI's understanding that other stations in the market not currently located on Mount Wilson support co-location of all facilites at that site. Other advantages of co-location include the fact that all the receive antennas in the market would only need to be pointed in one direction. Further, co-locating all stations to one site would reduce interference and could make more channels available

for DTV allotments. KSCI's DTV channel (61) will work at the station's present transmitter site but not on Mount Wilson where most of the other stations in the market are located. Hence, we therefore urge the Commission to modify its DTV table to facilitate co-location of all stations to Mount Wilson.

Respectfully submitted,

KSLS, INC.

By: Ray L. Beindorf
President

June 13, 1997

EXHIBIT 1

TV Station KSCI • Channels N18/D61 • San Bernardino, California

Statement of Stanley Salek, Consulting Engineer

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the licensee of TV Station KSCI, San Bernardino, California, to study the interference potential created by the co-channel allotment of TV Channel 18 for the digital television facilities of Station KUSI-TV, San Diego, California.

Background

TV Station KSCI is licensed to operate its NTSC television broadcasting facilities on Channel 18, with an effective radiated power ("ERP") of 3,310 kilowatts at a height above average terrain ("HAAT") of 725 meters, serving San Bernardino and the surrounding area. Station KUSI-TV is licensed to operate its NTSC television broadcasting facilities on Channel 51, with 2,880 kilowatts ERP at 579 meters HAAT, serving San Diego and the surrounding area. The Sixth Report and Order to FCC Mass Media Docket 87-268 ("Sixth Report and Order"), released April 21, 1997, allotted Channel 18 for the digital television ("DTV") facilities of KUSI-TV. The co-channel KSCI(TV) NTSC and KUSI-TV DTV facilities are separated by 179.9 kilometers, 64.7 kilometers short of the 244.6 kilometers specified in FCC Rule Section 73.623(d).

Deficiencies in Allotment Calculations

Appendix B to the Sixth Report and Order describes calculations and methodology used to develop the DTV Table of Allotments. Section 73.623(c)(2) of the revised FCC Rules references Appendix B as providing the procedure used to evaluate proposed modifications to allotted DTV facilities, along with Office of Engineering and Technology ("OET") Bulletin No. 69 which, as of this date, has not been released by the FCC. Appendix B provides a five-page summary of the procedures used to develop the allotment table, but by no means provides adequate guidance for conducting interference evaluations involving the newly-allotted DTV channels, with regard to potential interference to/from existing authorized NTSC facilities, or to/from other allotted DTV facilities.

In order to provide guidance to its clients that have received DTV allotments, Hammett & Edison obtained, directly from FCC OET, a copy of the computer software program used to generate the DTV allotment table. Once that software was operating properly and generating data consistent with that found in Appendix B, Table 1, presenting DTV allotment pairings with analog NTSC stations, the program was modified to serve as an analysis tool to study allotted DTV facility interference profiles and the effect of potential facility changes. This "forward looking" analysis program, as we have dubbed it, implements the desired-to-undesired ("D/U") ratios and taboo channels of revised Rule 73.623(c)(2), as opposed to the limits specified by the Advanced

Television Systems Committee for the Grand Alliance System[1] used by the FCC allotment computer program. A two-page description of that program accompanies this statement and is attached as Figure 1.

In its allotment study, the FCC calculated that 1.6% of the KSCI(TV) NTSC Grade B population could receive interference from the proposed co-channel KUSI-TV DTV facility. Our analysis program predicted 288,651 persons within the KSCI(TV) NTSC Grade B contour that could receive interference from the KUSI-TV DTV facility, which corresponds reasonably well with the FCC's figure, considering that the FCC program used some different D/U ratios and taboo channel studies. From our initial experience with the analysis program, we discovered that the Longley-Rice propagation model used by the Commission often returned errors on some studied paths, which resulted in the FCC allotment program (and, correspondingly, the Hammett & Edison analysis program) counting the associated error "cells" as *interference-free service area.* For facilities located on flat terrain, such as in areas of the midwest and in Florida, we have found that those error cells are generally few and the FCC's assumption of interference-free service does not greatly impact the overall results. However, in areas of mountainous terrain, we have found that the error cells can result within a significant part of a studied station's coverage area.

Figure 2 shows a map of the interference study for areas within the NTSC Grade B contour of KSCI(TV). Interpretation of the symbols is as follows: Asterisks are calculated interference cells, while circled plus signs represent cells where the Longley-Rice propagation algorithm fails, and hence are counted as interference-free service areas. Areas without symbols represent "verified" interference-free coverage. As can be seen, there are numerous "circled plus sign" areas, at which the FCC could not determine if interference existed or not, representing an additional U.S. population, based on the 1990 Census, of 1,454,176 persons.[2] Thus, the area of uncertainty in the interference calculations represents about 10% of the population within the KSCI(TV) NTSC Grade B contour. Similarly, Figure 3 shows a map of predicted interference to the KUSI-TV DTV facility by the KSCI(TV) NTSC facility. The FCC study method predicts interference by KSCI(TV) to 60,213 persons within the KUSI-TV DTV service area, but the added area of assumed interference-free service due to propagation algorithm failure includes 619,416 persons.[3] Clearly, this level of uncertainty is unacceptable, but it is inherent to the methodology used by the FCC to allot DTV channels for all NTSC TV stations within the Continental United States.

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1 Appendix A, Part II, to the Sixth Report and Order, pages A-2 and A-3.

2 Calculated Longley-Rice error cells shown over water contain no population.

3 While areas within Mexico are shown as being analyzed, no Mexican population has been included in the tabulation.

List of Figures

In carrying out these engineering studies, the following attached figures were prepared under my direct supervision:

1. Paper describing DTV interference analysis program methodology
2. Map showing calculated interference and Longley-Rice propagation model error locations within calculated KSCI(TV) NTSC Grade B contour
3. Map showing calculated interference and Longley-Rice propagation model error locations within calculated KUSI-TV NTSC Grade B contour.

Stanley Salek, P.E.

June 11, 1997

Affidavit

State of California
County of Sonoma | ss:

Stanley Salek, being first duly sworn upon oath, deposes and says:

1. That he is a qualified Registered Professional Engineer, holds California Registration No. E-14217 which expires on June 30, 2001, and is employed by the firm of Hammett & Edison, Inc., Consulting Engineers, with offices located near the city of San Francisco, California,

2. That he graduated from Florida Institute of Technology with a Bachelor of Science degree in Electrical Engineering in 1981, was employed from 1981 to 1991 in the field of radio engineering at companies including Motorola, Inc., Broadcast Electronics, Inc., Circuit Research Labs, Inc., and the National Association of Broadcasters, and has been associated with the firm of Hammett & Edison, Inc., since July 1991,

3. That the firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the licensee of TV Station KSCI, San Bernardino, California, to study the interference potential created by the co-channel allotment of TV Channel 18 for the digital television facilities of Station KUSI-TV, San Diego, California,

4. That such engineering work has been carried out by him or under his direction and that the results thereof are attached hereto and form a part of this affidavit, and

5. That the foregoing statement and the report regarding the aforementioned engineering work are true and correct of his own knowledge except such statements made therein on information and belief and, as to such statements, he believes them to be true.

Stanley Salek, P.E.

Subscribed and sworn to before me this 11th day of June, 1997

LINDA SIEMER
Comm. # 1099501
NOTARY PUBLIC - CALIFORNIA
Sonoma County
My Comm. Expires June 2, 2000

DTV.IXSTUDY™ Analysis Methodology

Implementation of FCC's Interference-Based Allocation Algorithm

On April 21, 1997, the Federal Communications Commission released its Sixth Report and Order to Mass Media Docket No. 87-268, establishing a final Table of Allotments for the transition from analog NTSC television service to a digital television ("DTV") service. The Commission utilized a complex set of computerized analysis tools to generate the DTV allotment table and added FCC Rules Section 73.623(b)(2), requiring that similar tools be employed to analyze individual DTV station assignments with regard to their potential interference to other DTV stations, DTV allotments, and existing or authorized NTSC facilities. Hammett & Edison has developed computer software to perform this function, based on an examination of the FCC software source code.

For any given NTSC or DTV station to be studied, the FCC analysis model first determines the location of the conventional F(50,50) Grade B contour of the NTSC station, or of the NTSC station associated with an assigned DTV station, using pattern information contained in the FCC engineering database and an assumed antenna elevation pattern. The model assumes that contour as an envelope, outside of which no protection from interference is implied or afforded. The location of the Grade B contour is also used to determine the assigned power for the DTV station, once again using conventional methods found in FCC Rules Section 73.699, Figures 9 and 10, but determining the power necessary on a radial basis to generate the associated DTV coverage contour (41 dBu for UHF, 36 dBu for high VHF Channels 7–13, and 28 dBu for low VHF Channels 2–6), for the assigned DTV channel. The maximum power determined using this method was assigned as the DTV operating power, provided it was calculated to be above established minimum power levels; otherwise, a minimum power level was assigned. Note that the use of this method usually creates a directional antenna pattern, even for DTV assignments to presently omnidirectional NTSC TV stations. The FCC requires that a DTV facility employ an antenna design that meets the calculated pattern, or that a nondirectional antenna be employed that does not exceed the directional pattern envelope in any direction, unless the creation of no new interference can be demonstrated.

In addition to the use of the Grade B envelope and an assumed directional transmitting antenna for all DTV facilities, the model assumes the use of directional receiving antennas at each studied location, or "cell." The characteristics of the receiving antennas are different not only for the low VHF, high VHF, and UHF frequency bands, but also for NTSC and DTV receiving situations, where, based on the FCC model, more directive antennas are employed for analysis of DTV reception.

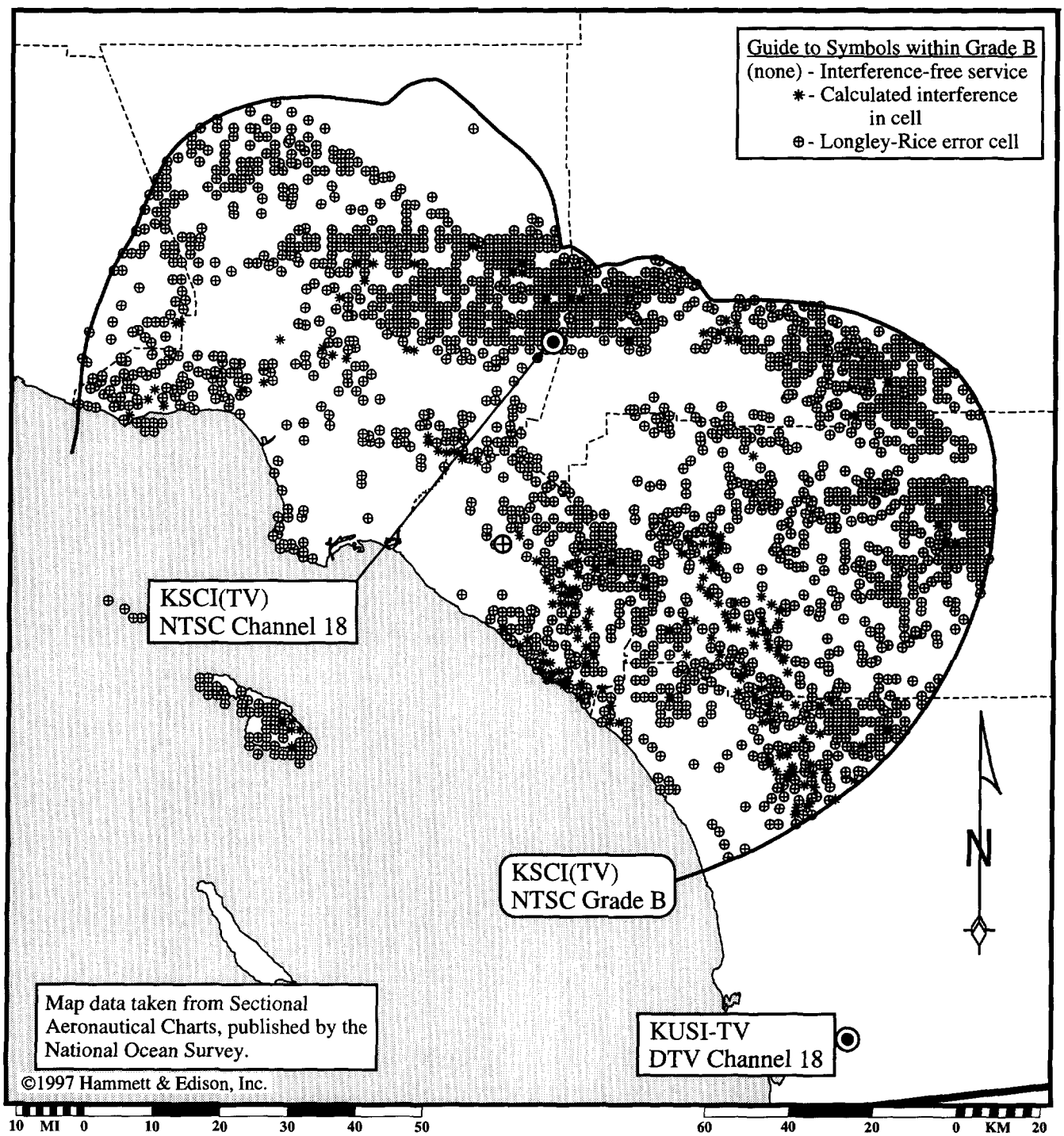
The FCC analysis technique employs terrain-sensitive calculation methods based on Version 1.2.2 of the ITS Irregular Terrain Model, also known as the Longley-Rice model. For each NTSC or DTV station to be studied, a grid of cells, two kilometers on a side, fills the associated Grade B contour. The program first determines which of the cells is predicted to receive service from the associated station, using Longley-Rice with F(50,50) statistical weighting for NTSC stations and F(50,90) statistical weighting for DTV stations. Cells determined to have no service are not studied for interference from other stations.* Once cells having service are determined, the software analyzes potential interference from other NTSC or DTV stations, again using the Longley-Rice propagation algorithm and F(50,10) statistical weighting for all potential interfering signals. Each cell is evaluated using the desired-to-undesired ratios presented in FCC Rules Section 73.623 for each channel relationship, and cells determined to have interference are flagged and summed with the study results of other cells, resulting in the generation of total interference area figures and tabulations of total population contained within the summed cells.

The Hammett & Edison analysis software program employs all of the analysis features described above, as well as several other more subtle elements employed in the FCC allotment program. Additionally, the Hammett & Edison program provides a graphical element that allows the identification of all interference cells on a map with an associated tabulation, and the program generates a DTV antenna pattern envelope that shows areas that can be maximized without creating interference in any cells that were not already receiving interference. The program can be used to test implementation scenarios that involve changes to antenna height, antenna pattern, channel number, and transmitter location. Additionally, the program has the capability to determine coverage areas of DTV and NTSC stations, with interference cells omitted. The Hammett & Edison program can also identify cells that fall in major bodies of water, based on digitized map data, summarizing those cells separately in an interference study or excluding them from a coverage study. Arguably, cells in water do not require protection from interference.

* It is noted that the Longley-Rice model is not always capable of determining, within certain confidence limits, whether a particular block has service. In such cases, the Longley-Rice algorithm returns an error code; the FCC method for handling such error codes is to assume the associated cells have interference-free service, and as such, are not considered further. This assumption is presently being scrutinized by Hammett & Edison to determine its validity and to identify possible situations where significant actual interference areas may be overlooked from station studies.

TV Station KSCI • Channels N18/D61 • San Bernardino, California

Calculated KUSI-TV DTV Interference to KSCI(TV) NTSC Plus Longley-Rice Error Cell Locations Determined Using FCC Algorithms



TV Station KSCI • Channels N18/D61 • San Bernardino, California

Calculated KSCI(TV) NTSC Interference to KUSI-TV DTV Plus Longley-Rice Error Cell Locations Determined Using FCC Algorithms